SOIL SURVEY OF COWETA AND FAYETTE COUNTIES, GEORGIA.

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DESCRIPTION OF THE AREA.

The area comprising Coweta and Fayette Counties lies in the western part of the State of Georgia, north of Columbus and about 25 miles southwest of Atlanta. It is bounded on the north by Campbell County, on the east by Clayton and Spalding Counties, on the south by Meriwether and Troup Counties, on the west by Heard County, and on the northwest by Carroll County. The eastern boundary of Fayette County is formed in part by the Flint River, and the northwestern boundary of Coweta County by the Chattahoochee River. Coweta and Fayette Counties are separated by Line Creek. The combined area of the two counties is 643 square miles, or 411,520 acres, Coweta covering 443 square miles and Fayette County 200 square miles.

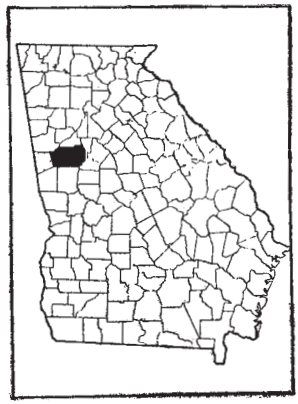

FIG. 18.—Sketch map showing location of the Coweta and Fayette Counties area, Georgia.

Coweta and Fayette Counties lie within the Piedmont region, a physiographic division of the eastern part of the United States extending from New Jersey southwestward through Georgia and terminating in eastern Alabama. They are situated in the central part of this region as it crosses the State, being practically midway between the Appalachian Mountains on the north and the Coastal Plain on the south.

The topography varies from gently rolling to sharply rolling and broken, and is the result of a long period of erosion upon an old level plain or peneplain. The whole area is divided by the major streams into broad divides, and these divides are again divided and subdivided by smaller streams until the whole area consists of a series of rounded ridges with rounded or steep slopes. The topog-

raphy of the area, while typical of the Piedmont region, is not as broken and hilly as that of some areas in other parts of the region, but is somewhat more rolling and hilly than in those found farther east in parts of central Georgia. It varies locally in the two counties. The greater part of Coweta County is characterized by undulating to rolling ridges with long slopes, which are more or less cut by heads of streams and gullies, or which may be rather steep along some of the streams. As the Chattahoochee River is approached on the northwest the topography becomes more sharply rolling, the divides becoming narrower and the slopes steeper. For a distance of 3 or 4 miles immediately along this river the country is decidedly rolling to hilly, with much broken land, especially along the streams which empty into the river. Large areas of rough hilly land are found in the vicinity of Wahoo and Pearsons Creeks. Some rough areas are also found along Caney Creek in the western part of the county. These areas of hilly lands are characterized by narrow-crested ridges and steep and broken slopes. As the eastern part of Coweta County is approached from Newnan the divides become broader and more or less undulating, while the slopes are gentle and not so broken by gullies and heads of streams as west of Newnan. The smoothest topography of the county is in the region surrounding Senoia. The topography of the western part of Fayette County is similar to that of eastern Coweta County, but eastward it again becomes more rolling with narrower ridges and steeper slopes, and as the Flint River is approached it is sharply rolling to hilly. The surface configuration over most of the area, however, is favorable for the use of improved farm implements, including tractors.

The drainage of Coweta and Fayette Counties is carried by the Chattahoochee and Flint River systems. These streams with their branches divide and subdivide, forming a network which ramifies throughout the entire area. The divide between these two rivers is practically followed by the Atlanta & West Point Railroad, this road crossing only one stream as it passes through Coweta County. The drainage to the west of the railroad is effected by the Chattahoochee River, through Cedar and Wahoo Creeks in the northwestern part of Coweta County, and through Caney and Mountain Creeks and New River in the southwestern part. These streams flow westward or southwestward. East of the divide in Coweta County the drainage is toward Line Creek (the boundary between Coweta and Fayette Counties) and is carried by Shoal, Whiteoak, Little Sandy, Little Whiteoak, and Deadoak Creeks and their branches. All these streams flow in a southerly to southeasterly direction. Whiteoak and

Little Whiteoak Creeks do not empty into Line Creek, but flow directly into Flint River in Meriwether County.

The greater part of Fayette County is drained by Line and Whitewater Creeks. These streams with their branches, Flat and Camp Creeks, flow almost due south and join in the southern part of the county near Chestlehurst. Line Creek empties into the Flint River, a short distance south of Fayette and Meriwether Counties. The drainage directly into the Flint River in the eastern part of Fayette County is effected by rather short laterals. Morning Creek is the largest stream and drains the northeastern part of the county. Middle Creek forms a part of the boundary between Fayette and Clayton Counties. There are no poorly drained areas in the counties, but on the other hand the drainage is too rapid in some sections and causes serious damage by erosion.

Coweta County was formed in 1826 and was named for the Cowetas, or Lower Creek Indians. According to the 1920 census the county has a population of 29,047, of which 75.8 per cent is classed as rural, the rural population averaging 49.7 persons per square mile. Newnan, the county seat of Coweta County and the most important town of the two counties, has a population of 7,037. Other towns of local importance in Coweta County are Grantville, in the southwestern part, and Senoia, in the southeastern part, with populations of 1,200 and 906, respectively.

Fayette is the older of the two counties, having been created in 1821. It has a population of 11,396, all classed as rural, and averages 48.7 persons per square mile. Fayetteville, the county seat, has a population of 952.

The transportation facilities of the two counties are very good. The Atlanta & West Point Railroad, which operates between New York and New Orleans, passes through Coweta County in a northeast-southwest direction from Grantville to Palmetto (in Campbell County). The Chattanooga Branch of the Central of Georgia Railroad crosses Coweta County in a northwest-southeast direction, intersecting the Atlanta & West Point Railroad at Newnan. The Columbus Branch of the Central of Georgia extends southward from Newnan through the central part of the county. The Atlanta, Birmingham & Atlantic Railroad between Atlanta and Brunswick passes through the western part of Fayette County and the eastern part of Coweta, crossing the Central of Georgia at Senoia. A branch of the Southern Railway passes through the eastern part of Fayette County.

Coweta County has an extensive public-road system which is well built and maintained. Operations have been begun on a concrete

road system. The roads of Fayette County extend to all parts of the county and are fairly well maintained. Rural mail delivery and telephone systems extend to all parts of both counties.

CLIMATE.

The climate of Coweta and Fayette Counties is very healthful. It is characterized by long hot summers and short open winters. The rainfall is ample, with many clear, sunshiny days.

The moderate winters include mild balmy weather, usually followed by rain, and cold spells of a few days' duration, during which the temperature may drop very low, even to zero. The mean winter temperature is 44° F. The highest recorded winter temperature is 81° F. at Griffin (Spalding County), and the lowest —9° F. at Newnan.

The summer season is generally long and hot, with temperatures rising as high as 104° F., but the heat is somewhat moderated by the many thunderstorms occurring during these months. Spring and fall are the most pleasant seasons of the year.

The rainfall, which averages about 50 inches a year, is distributed throughout the growing season. Most of the rainfall occurs during the months of July, August, December, and February. The fall months are generally the driest, which is especially favorable for the harvesting of crops. During the driest year on record the precipitation was 32 inches, which, however, was distributed through the growing season and was sufficient for the crops.

The average growing season extends from March 26 to November 6, a period of 225 days. The latest killing frost in the spring occurred on April 26, and the earliest in the fall on October 21.

The tables below, giving the normal monthly, seasonal, and annual temperature and precipitation, compiled from the records of the Weather Bureau stations at Newnan and Griffin, the latter in Spalding County, 15 miles from the Fayette County line, are representative of the general climatic conditions in Coweta and Fayette Counties:

Normal monthly, seasonal, and annual temperature and precipitation at Newnan, Coweta County.

[Elevation, 959 feet.]

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year (1904).	Total amount for the wettest year (1901).
	° *F.*	° *F.*	° *F.*	*Inches.*	*Inches.*	*Inches.*
December	44.5	74	8	4.84	3.44	6.68
January	43.6	78	6	3.88	3.85	6.10
February	44.6	80	−9	5.46	4.67	5.86
Winter	44.2	80	−9	14.18	11.96	18.64
March	54.1	92	16	5.57	2.12	5.12
April	61.3	94	29	3.90	1.37	2.77
May	71.2	98	35	3.57	2.63	9.85
Spring	62.2	98	16	13.04	6.12	17.74
June	77.6	103	45	4.51	1.39	4.03
July	79.5	102	54	5.53	1.30	4.55
August	78.8	102	57	6.85	9.11	8.15
Summer	78.6	103	45	16.89	11.80	16.73
September	74.1	99	38	3.16	0.05	7.41
October	55.6	97	25	2.95	0.00	1.65
November	52.9	89	14	2.83	2.28	1.21
Fall	60.8	99	14	8.94	2.33	10.27
Year	61.2	103	−9	53.05	32.21	63.38

Normal monthly, seasonal, and annual temperature and precipitation at Griffin, Spalding County.

[Elevation, 975 feet.]

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year (1904).	Total amount for the wettest year (1906).
	° *F.*	° *F.*	° *F.*	*Inches.*	*Inches.*	*Inches.*
December	45.2	74	5	4.90	3.95	3.98
January	43.3	78	8	3.34	3.75	5.72
February	45.3	81	4	5.61	3.69	1.37
Winter	44.6	81	4	13.85	11.39	11.07
March	54.8	91	17	4.92	2.07	7.43
April	62.2	93	24	3.46	1.88	0.48
May	71.5	101	36	3.21	3.09	2.39
Spring	62.8	101	17	11.59	7.04	10.30

Normal monthly, seasonal, and annual temperature, etc., at Griffin—Continued.

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year (1904).	Total amount for the wettest year. (1906).
	° F.	° F.	° F.	*Inches.*	*Inches.*	*Inches.*
June	77.7	103	45	4.55	1.66	7.84
July	79.7	104	55	5.37	2.70	4.14
August	79.0	103	55	5.56	6.44	8.66
Summer	78.8	104	45	15.48	10.80	20.64
September	74.7	99	39	3.04	0.42	4.32
October	63.7	93	26	2.72	0.39	4.75
November	53.6	83	14	2.55	2.87	2.60
Fall	64.0	99	14	8.31	3.68	11.67
Year	62.6	104	4	49.23	32.91	53.68

AGRICULTURE.

The agricultural development of Coweta and Fayette Counties is similar to that of all the inland counties of this region. The earliest evidences of agricultural activity were clearings in the virgin forest made by the Indians, after which other clearings were farmed by the early settlers who followed upon the heels of the traders. The agriculture of the earliest times was purely incidental, as only those crops which were necessary for sustenance were grown in a very limited way. Among these crops were corn, wheat, and barley. Cattle, hogs, and sheep fed upon the open range and were depended upon to furnish the chief part of the food and clothing. Later they were used as exchange for other commodities.

The first really important development in these counties began about 1825, when the country was opened to settlement by the State on a lottery basis, after the second treaty with the Creek Indians at Indian Springs. Settlers from the Carolinas, Virginia, and other parts of Georgia took up the land, cleared it of the heavy timber growth, and started farming upon an important scale. Slave labor was depended upon.

The early agricultural practice was very wasteful. As the cleared land declined in productiveness with uninterrupted cropping, patches of new land were brought into cultivation, and the old fields were left exposed to the ruinous erosion which soon took place. Rows laid off up and down the hills to facilitate drainage were the beginning of a number of gullies and eroded areas. Many such areas are

now covered by second-growth forest. So thoroughly was the land cleared that very few tracts of the original forest remain. This consisted of hardwoods, red, white, black, and Spanish oak; hickory; the old forest pine; and some chestnut. Practically all the chestnut has now disappeared. Along the bottom lands were gums, oaks, especially white oak, elm, hickory, sycamore, willow, tulip poplar, alder, and many other species. The present growth consists chiefly of second-growth shortleaf pine, with a small sprinkling of oaks and second-growth hickory. About 80 per cent of Coweta County and about 75 per cent of Fayette County is cleared.

With the establishment of towns and railroad facilities, commodities that could be more economically purchased than produced were displaced by crops for which the soils and climate were better suited. The adaptation of the soil to cotton was soon recognized, and this crop gradually increased in importance until at the close of the Civil War it had become the chief cash crop. Other crops were practically discontinued, and it became necessary to purchase grains and animal products outside of the counties.

The commercial activities of the counties are still centered about cotton. Credits and the price of land are influenced by the price and production of this one crop. Agencies are now at work to make this a surplus crop, and the effects are felt to some extent. In 1899 Coweta County had a production of 23,700 bales on 67,452 acres, while in 1919 the production was 30,525 bales on 67,829 acres, or an average of 0.45 bale per acre. The acreage devoted to cotton represents 50.1 per cent of the improved farm land of the county. In Fayette County the yield in 1899 is reported as 9,476 bales on 29,205 acres, and in 1919 as 16,207 bales on 33,587 acres. The average yield per acre in 1919 was 0.48 bale per acre, and the crop occupied about 51.7 per cent of the improved farm land of the county. The slight difference in the average acreage yield in Coweta and Fayette Counties is probably due to the fact that 4.3 per cent more farms are operated by tenants in Coweta than in Fayette County. An appreciable quantity of the cotton produced in Coweta County is utilized by local mills.

The corn crop stands second in importance, but the amount produced is insufficient to supply the local demand. In Coweta County in 1899 there was a production of 350,450 bushels on 31,766 acres, while in 1919 the production increased to 554,352 bushels on 38,910 acres. In Fayette County in 1899 217,040 bushels were produced on 19,812 acres, and in 1919 there were 266,614 bushels produced on 19,033 acres. In Coweta County this crop occupies 28.7 per cent of the improved farm land and yields an average of 14.2 bushels per acre, while in Fayette County 29.3 per cent of the improved land is in corn, with an average yield of 14 bushels per acre. Within

the last few years Fayette County has been producing a quantity which nearly meets its need. All the crop is used on the farms for stock feed or made into meal for food. The prolific varieties of corn are grown almost exclusively.

Cowpeas are probably the third crop of importance. They are grown for hay, forage, seed, and soil improvement.

The oat crop has been neglected during the last 20 years, until it occupies less than 1 per cent of the improved farm land. In Coweta County in 1899 the oats production was 30,710 bushels on 3,993 acres, while in 1919 the yield was 15,830 bushels on 947 acres. For 1919 the average yield was 16.7 bushels per acre. In Fayette County in 1899 the production was 10,910 bushels on 1,137 acres, and in 1919 the production was 8,282 bushels on 458 acres, or an average of 18 bushels per acre. All the oats produced in these counties are used on the farm. The crop is either cut green for hay, fed in the straw, or threshed. Among the varieties grown the Fulghum is the most popular, while Texas Rustproof and Appler are also used.

Wheat and rye are grown to a very small extent. The wheat is ground into flour at the local mills and used on the farm. The Georgia Blue Stem is practically the only variety of wheat grown. The rye crop is generally used for winter pasture and as feed for chickens.

Alfalfa is grown chiefly in an experimental way, the yields ranging from 2 to 4 tons per acre.

The live-stock industry is unimportant. The meat produced is not sufficient to supply the local demand of the counties. In recent years, however, increased interest has been shown in pork production, resulting in the growing of larger numbers and also better types of animals. Hampshire, Poland-China, Duroc-Jersey, and Berkshire breeds are found on a large number of farms. Increased interest is also manifested in improved breeds of cattle, chiefly of beef types—Hereford and Shorthorn. A number of sires of good breeding are owned in the area, and a few purebred herds are found. The improvement of the native cattle by using purebred sires appears to be the chief interest of most of the farmers engaged in cattle production. The proximity of the counties to Atlanta as a market for dairy products would seem to warrant an interest in the production of dairy products, but this has not developed to the extent that might be expected. There are, however, a few dairy farms that ship milk to Atlanta. The dairy herds are composed of Jersey and Holstein grades, with a small number of purebred animals. The pork business has advanced considerably since 1900, the 1920 census reporting 10,349 hogs in Coweta County and 4,303 in Fayette County.

Because of the small number of crops which make up the agriculture of the county, the farmers do not have an opportunity to

recognize the adaptations of the various soils to crops except in a small way. The differences in the soils are usually considered in their relation to the cotton crop. In dry seasons the best yields are obtained on the sandy loam types, while in wet seasons the cotton suffers on these soils, and the clay loams and sandy clay loams are preferred. Cotton is not planted on first-bottom soils, as it produces a rank growth of stalk at the expense of fruit. The bottom-land types are consequently used for corn and forage crops, which produce high yields on these soils. Cowpeas make a heavy growth of forage with only a small yield of seed. The Durham, Appling, and Cecil sandy loam types are preferred for sweet potatoes and sorghum. The sirup from sorghum grown on the Durham and Appling sandy loams has a light color and an especially fine flavor. The Davidson clay loam is generally recognized as a very strong and productive upland type.

Mules are depended upon for farm work; few horses are used. The implements on the average farm are light and unsatisfactory for plowing and cultivation under the more advanced ideas of soil management. Heavier plows and improved implements of cultivation are fast becoming popular on the more improved farms. A number of tractors are used for plowing and cultivation. The average farm buildings are small, but they meet the needs of the cotton farmer. With the more general use of improved implements the farm buildings will have to be enlarged to house them properly.

The land for cotton is prepared in the winter, if the weather permits, or during the spring. It is usually listed over the fertilizer, and the seed is planted upon the beds. Fall plowing is desirable but can not always be done, as the fall season is almost wholly taken up with picking the cotton. On some of the best farms the land is plowed broadcast during the fall and then harrowed and laid off in the spring. Level cultivation is practiced in a number of cases. The cotton crop is usually planted between early April and late May.

The first cultivation of cotton generally consists of "barring off," a process of turning the soil away from the young plants and leaving the cotton on a narrow ridge. This facilitates the chopping out process which follows and is carried out by the use of hand hoes. The land is then turned to the plants again, and subsequent cultivations are by sweeps and scrapes. The crop usually receives from four to six cultivations.

The corn crop usually is given less efficient cultivation than cotton. Scarcely any of the land is plowed broadcast or in the fall. The land is usually laid off with small turning plows, and the fertilizer, when any is used, is applied with the seed in the water furrow. Much

of the fertilizer and seed is dropped by hand, although corn planters and fertilizer distributors are becoming popular. Lack of efficient methods in handling corn is the chief cause of the low yields. The highest yields are obtained on those farms where the land is well prepared with modern implements and well cultivated. The corn crop receives at least three but scarcely ever more than five cultivations. Planting is done from late March to the middle of June. The farmers usually make several plantings in order to avoid having the entire crop injured should a drought occur during the development of the grain. The leaves of the corn are pulled for fodder, either during the latter part of July or in August. Some farmers cut the corn, place it in shocks, and later shred it. Cowpeas are usually planted in the corn fields for forage, soil improvement, or seed. The crop also follows oats when intended for hay. The seed is usually sown broadcast and plowed or disked under.

The oat crop is seeded in a number of ways. Generally the seed is sown broadcast and plowed under with light turning plows. It is also drilled in after the land has been plowed broadcast and harrowed. Another method which is fast finding favor is to seed the crop between the cotton rows with small drills. Farmers recognize the value of early seeding of oats; it is desirable to sow the crop in the latter part of September or early October. But as this is the busiest time of the year it is often late fall or early winter before the crop is in.

Wheat and rye are sown after the first frost in about the same manner as oats.

Commercial fertilizers are depended upon almost entirely in the production of the cotton crop, and to a small extent for corn. The amount annually expended for fertilizers is increasing at the rate of 10 per cent annually. The expenditure for Coweta County in 1899 was $108,860 and in 1919 $196,008, or $60.10 per farm reporting. The Fayette County expenditure for 1899 was $43,770, and for 1919 $280,104, or $145.81 per farm. Practically all ready-mixed goods are used. Most of the fertilizer is used on cotton, 250 pounds of either 10–2–2 [1] or 9–3–3 grade per acre being the average application. The tenant farmers use about 200 pounds per acre, while the farmers operating upon their own land use up to 500 pounds per acre. A mixture of acid phosphate and cottonseed meal is sometimes used, being applied at the rate of 400 to 500 pounds per acre. For corn, when commercial fertilizers are used, an average application consists of about 200 pounds of the same grade as for cotton. Some farmers give the corn crop only a light sprinkling of stable manure, applied in the drill. Many use no fertilizer of any kind. The oat

[1] Formulæ stated in the order phosphoric acid, nitrogen, potash.

crop may receive a small quantity of fertilizer at the time of planting, or about 100 pounds of nitrate of soda in the spring. For wheat most of the farmers use 400 to 500 pounds of acid phosphate and cottonseed meal. One hundred pounds of nitrate of soda may also be applied in the spring.

No definite crop rotations are practiced in these counties. Some farmers change the crops as often as possible, but fields are known to have been continuously planted to cotton for 40 or 50 years. With the tenant problem and a one-crop system, the rotation of crops is difficult to follow.

Much of the farm labor is drawn from the colored population. During ordinary times the supply is generally ample, but at the present time (1919) labor is scarce and wages high.

In 1919 there were 3,374 farms in Coweta County, representing 76.2 per cent of the land area. The average size of the farms is 64.0 acres, of which 40.1 acres are classed as improved. In Fayette County there were 2,026 farms with an average of 48.2 acres, of which 32 acres were classed as improved.

The farms of Coweta and Fayette Counties are chiefly operated by tenants, the percentage in 1919 for Coweta County being 82 and for Fayette County 77.7. Most of the farms have been operated by tenants for the last 50 years. This fact must be considered in connection with the increased expenditure for fertilizers. A rental charge of from 1,000 to 1,250 pounds of lint cotton is fixed for each one-horse farm comprising 25 to 30 acres. Under the share-rent system the landlord furnishes the implements and stock and one-half the fertilizer, while the tenant furnishes one-half the fertilizer and the labor, and the produce is equally divided.

Land values in the two counties range from $25 to $100 or more an acre, depending upon the location and improvements.

SOILS.

Coweta and Fayette Counties lie within the Piedmont region of the State—a region of crystalline rocks of unknown age. The upland types of soil are derived directly from the rocks immediately underlying the soil material and are influenced by their character and composition. The alluvial or bottom-land types are derived from the same rocks, but less directly than the upland soils, the soil-forming material having been transported and modified by running water.

The upland soils, being residual from the underlying rocks, may be divided into three groups according to the composition of these rocks, which affects the character of the material, its color, and its chemical composition.

The first group of rocks gives rise to nearly 90 per cent of the soil area. It consists of the light-colored feldspathic rocks, chiefly gneisses

of various textures. These rocks are characterized by the presence of a large amount of biotite and range from schists to granite. In the western part of Coweta County, west of Caney Creek and extending northeast to the Chattahoochee River, there is an area of coarse to very coarse grained biotite gneiss which is quite conspicuous on account of this coarse texture. In the northeastern part of Coweta County, just south of Palmetto (Campbell County), there is an area of about 30 square miles in which a coarse-grained porphyritic granite is conspicuous. Rocks of this group are found in a few places in the western part of Fayette County. This entire group, composed essentially of gneisses, is cut by mica schists and some hornblende schists in all parts of the counties. In many places the proportion of these latter rocks is so large that the areas would be more properly considered a mixed rock formation. Through the weathering of rocks of this group the Cecil, Durham, and Appling soils are formed. The types are characterized by sandy surface soils and red or lighter colored heavier subsoils. The Cecil clay loam has a heavy surface soil, but this type is influenced either by surface erosion or by the presence of hornblende schists in the underlying rock formation. From a chemical standpoint the soils derived from this group of rocks are well supplied with potash coming from the feldspar. The lime content is one-fourth to one-tenth that of the potash.

The second group of rocks is composed wholly of dark-colored, or basic rocks, consisting of hornblende schist, diorite, or diabase, which cut through the light-colored rocks in the form of dikes. Areas of rocks of this group are found both in Coweta and Fayette Counties. The soils derived from these rocks are characterized by their heavy surface soils and subsoils and their dark color. The Davidson and Iredell series are derived from these rocks. As the dark-colored rocks are basic, the soils show a higher proportion of lime than those derived from the light-colored acidic rocks. The lime content ranges from one-fourth that of potash to an equal amount.

The third distinguishing rock formation consists of a mica schist to mica gneiss which contains such a large quantity of mica that its effect is shown in the soil and subsoil. This mica imparts a slick or greasy character to the soil material. On this account it is separated from the first group of soils derived from the light-colored acidic rocks. The Louisa series is derived from this rock. The soil shows a high content of potash and a relatively low content of lime, the potash running from 10 to 50 times as much as the lime.

The alluvial soils have been deposited at widely different times, as is shown by their present position and topography. They are accordingly separated into two groups. The old alluvial material

is now well above overflow and occupies terraces, bench lands, or second bottoms. The soils from this material in this area belong to the Wickham series and are found along the Chattahoochee River in Coweta County and along the Flint River in Fayette County. The alluvial material, which is of more recent origin, occurs along the first bottoms or flood plains of the streams and is subject to overflow. This material gives rise to the Congaree series of soils, which is developed in both Coweta and Fayette Counties.

In the classification of the soils the series mentioned above embrace those types that are similar in origin and color, and in structure of the soil and subsoil. The series is made up of a number of types, determined by differences in the texture of the surface material.

The Cecil series is characterized by gray to reddish-brown surface soils and by a light-red or brick-red, stiff, brittle clay subsoil, which becomes sticky and plastic when wet. The series has three types in these counties—the sandy loam, sandy clay loam, and clay loam. A hilly phase of each type is also mapped.

In the types of the Durham series the surface soils are light gray to light brownish gray, and the subsoil consists of a pale to bright yellow, friable sandy clay loam. Only one type is found in these counties—the sandy loam.

The Appling series is intermediate between the Cecil and Durham series. The surface soil of the Appling types is usually a light brownish gray and the subsoil a yellow sandy clay, becoming mottled with red in the lower part. The subsoil also may be reddish yellow or salmon colored, but is never distinctly red. The sandy loam of the series is mapped in the present survey.

In the types of the Davidson series the surface soils are dark red to dark brownish red, and the subsoil, which consists of sticky, heavy clay, a deep red or maroon red. Fragments of the dark-colored rocks from which the soil material is derived are usually present on the surface or in the soil and subsoil. The clay loam type is mapped in small areas in both Coweta and Fayette Counties.

The soils of the Louisa series are similar in color characteristics to those of the Cecil series, but are distinguished by the presence of large quantities of mica, which gives the material a slick or greasy feel when rubbed between the fingers. Only the sandy clay loam of this series is mapped. It is developed in Coweta County.

The types of the Iredell series have a dark-gray or dark grayish brown surface soil and a sticky, waxy clay subsoil easily distinguished from the subsoil of other series by its yellowish-brown tinged with green. The series is represented by small areas of the fine sandy loam in Coweta County.

The surface soils of the types included in the Wickham series are grayish brown to reddish brown, and the subsoil reddish brown to red. The subsoil material is a silty clay in texture. Areas of the fine sandy loam are mapped in both Coweta and Fayette Counties.

In the types of the Congaree series the surface soils vary from grayish brown to reddish brown. The subsoil is typically a reddish-brown to brown, friable silty clay loam to silty clay. Strata of other material occur in places. The fine sandy loam of this series is mapped in Coweta County, and the silty clay loam in both Coweta and Fayette Counties.

Meadow (Congaree material) is mixed alluvial material to which no type designation could be given. It is mapped along many streams throughout the area surveyed.

The following table gives the names and the actual and relative extent of the various soils mapped in Coweta and Fayette Counties:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Cecil sandy clay loam	209,152	51.0	Davidson clay loam	13,120	3.2
Hilly phase	832		Congaree silty clay loam	10,368	2.5
Cecil sandy loam	54,720	13.7	Louisa sandy clay loam	5,696	1.4
Hilly phase	1,792		Congaree fine sandy loam	2,048	.5
Cecil clay loam	39,104	9.7	Wickham fine sandy loam	576	.1
Hilly phase	768		Iredell fine sandy loam	512	.1
Appling sandy loam	32,320	7.9			
Meadow (Congaree material)	21,696	5.3	Total	411,520	.....
Durham sandy loam	18,816	4.6			

CECIL SANDY LOAM.

The surface soil of the Cecil sandy loam consists, in the upper part, of a gray to light brownish gray or light-brown, loose, friable sand to loamy sand, and, in the lower part, of a yellowish-gray material of the same texture. The depth of soil is 6 to 10 inches, the average being about 7 inches. The upper subsoil is normally a heavy sandy loam or sandy clay, but this soon passes into a heavy, stiff, brittle red clay, which extends to a depth well below 3 feet. When wet the lower subsoil is tenacious and plastic. Between the surface soil and the subsoil there exists a stratum of friable, reddish-yellow, heavy sandy loam to light sandy clay, varying from an inch or two to 12 or 14 inches in thickness. Where this layer is thickest the type resembles the Appling sandy loam. Included with the type are small areas of the Cecil sandy clay loam and the Appling sandy loam, as the type is intermediate between the two and grades toward each. The included areas are too small to separate on a map of the

scale used in this survey. The sand of the surface soil varies from fine to coarse in local areas not large enough to be mapped separately.

The type as a whole is free of stony material, but in a few localities quartz veins outcrop and give rise to small areas, in which rock fragments are sufficiently numerous to interfere with cultivation. These areas are indicated on the map by stone symbols.

The Cecil sandy loam is derived through weathering from biotite granitic gneiss which ranges from medium to coarse in texture. Some mica schist is included with the formation.

This soil is typically developed in large areas in all parts of the area surveyed. Its largest development in Coweta County is in the northwestern part, from the vicinities of Handy and Welcome north to the Chattahoochee River. This area is derived from a coarse-grained to porphyritic gneiss. The topography is very rolling, the ridges are narrow, and the streams have cut their channels deep. In some places the type grades very close to the Appling sandy loam. Another area of importance is found in the southeastern part of the county in the vicinity of Harmony and Neriah Churches and Nixon Grove School. In this section the type occurs on a smooth to very gently rolling topography. Other well-developed areas are mapped in the vicinity of Sharpsburg in the east-central part of the county. Smaller areas are found in all parts of the county.

The type is mapped in areas of various size throughout Fayette County. A fairly large development lies in the northwestern part in the vicinity of Tyrone and Stop. Here much of the type is derived from a coarse-grained to porphyritic granitic gneiss or granite. Other appreciable areas are developed near Harp, Fayetteville, and Hopeful Church.

The Cecil sandy loam occurs in all topographic positions, but in the main occupies gently rolling to rolling country. The broader and better developed areas occur on the crests of ridges and slopes alike, but some smaller areas are confined to the crests or smoother parts of the ridges. This is especially true in Fayette County and in the southwestern part of Coweta County. The surface promotes good drainage, and over a large proportion of the type the run-off is rapid and erosion active on slopes not protected by terracing. The internal drainage is imperfect in many places, and crops are damaged in wet seasons by the excess of water held in the surface soil by the stiff subsoil. Dry seasons or seasons of moderate rainfall are preferred on this type.

The Cecil sandy loam is one of the important soil types of the area. More than 75 per cent of it is cleared and under cultivation. Practically all the native hardwood growth has been removed, and the present forest consists of second-growth shortleaf pine, with scat-

tering oaks and hickory. Cotton, the chief crop, yields from one-fourth to more than 1 bale per acre, with an average of two-fifths bale. Corn yields 8 to 35 bushels, with still higher yields on carefully prepared land. The average corn yield is, however, only about 12 bushels. The average yield of oats is about 15 bushels, and of wheat about 9 bushels per acre. Cowpea hay yields one-half ton to 1 ton or more per acre. The crops on this soil are fertilized and handled in the same way as on the other soil types of the area.

Land of the Cecil sandy loam type sells for $35 to $100 or more an acre, depending upon location and improvements.

This soil is well suited to general farming and to special crops, such as peaches and truck crops. Sweet potatoes yield well, and the type could be used to advantage in their production on a commercial scale. The soil can be plowed and cultivated with light implements and under a wide range of moisture conditions. Its greatest need is the incorporation of organic matter. This can best be supplied by turning under green-manuring crops, especially legumes. The rotation of crops would also benefit the type.

Cecil sandy loam, hilly phase.—The hilly phase of the Cecil sandy loam has a more rough and broken topography and a lower agricultural value than the typical soil. Otherwise the two are identical. The surface features consist of narrow-crested ridges and steep slopes cut and broken by the heads of streams. Areas of this phase are mapped in the northwestern part of Coweta County, near the Chattahoochee River, and along Wahoo, Pearsons, and Turkey Creeks. The phase could be utilized to advantage for forestry and pasture.

CECIL SANDY CLAY LOAM.

The surface soil of the Cecil sandy clay loam is quite variable, but under typical conditions in the undisturbed state it consists of 3 or 4 inches of a light brownish gray to brown, friable loamy sand to light sandy loam, underlain by a friable brownish-red clay loam which extends to an average depth of 7 or 8 inches. When turned by the plow the material becomes a typical brownish-red sandy clay loam through the mixing of the lighter sandy material on the immediate surface with the clay loam beneath. The subsoil, beginning at 7 or 8 inches, consists of a brittle, heavy, brick-red clay, containing some finely divided mica flakes. When wet the subsoil becomes sticky and somewhat plastic. The subsoil extends to depths well below 3 feet without any appreciable change. The type is rather free of stony material, except in local spots where quartz rock occurs in sufficient quantity to produce stony areas. These spots are shown on the map by stone symbols.

This type in its large areas is not as uniform as the other types of the Cecil series. There are small included spots of the grayish-colored Cecil sandy loam and of the reddish-brown to red Cecil clay loam scattered throughout these areas, and the greater part of the type is a gradation between the two. These small areas are so intricately associated that they could not be mapped separately. The surface layer of sandy material is too shallow for the sandy loam type and too thick for the clay loam type. The lack of uniformity in the depth of this surface mantle of sand and its irregular distribution as affected by erosion or other forces are the chief causes for the irregularity of the surface soil. The fact that this type is a mixture or gradation between the other Cecil types mapped gives rise to the local name of "mulatto land."

The Cecil sandy clay loam is an upland residual soil, derived through the weathering of light-colored or feldspathic rocks, ranging from medium-grained biotite gneiss to coarse-grained porphyritic gneiss or granite. Mica schist, as well as some hornblende schist, cuts through the dominating formations. Pegmatite also occurs in narrow veins. Many areas exist in which the rocks are covered by a thick layer of soil material so that their character can not be determined.

The Cecil sandy clay loam is the most extensive type in the present survey, occurring in broad areas in all parts of both Coweta and Fayette Counties. In the former it is developed in large areas from one end of the county to the other and includes some notable local variations. In the western part of the county, in the vicinity of Caney Creek and near the Chattahoochee River, the topography becomes more rolling than typical. In the northwestern section of the county the surface mantle of sand becomes thicker as the sandy soils are approached. In the northern part of the county, along the Atlanta & West Point Railroad and extending west about 3 miles, there is an area of about 7 square miles in which the sandy surface layer contains an appreciable quantity of coarse sand and a small quantity of fine gravel. The soil of this area is derived from a coarse-grained porphyritic gneiss or granite. Through the central and southeastern parts of the county the smoothest areas are found, the topography being gently rolling or undulating, with broad ridges and long, gentle slopes. The predominating rock giving the soil material is gneiss, but a large proportion is contributed by mica schist and hornblende schist. These latter rocks occur in varying quantities in all parts of the county.

The Cecil sandy clay loam also occurs in large areas in Fayette County. In the northeastern part it is rather spotted in character, and in the southern part it grades close to the clay loam type. In the

western part it approaches the sandy loam in character, and in some areas in the vicinity of Tyrone and southwest of Bennet Lake there is a small quantity of coarse material in the surface layer. The soil is almost entirely formed through the weathering of light-colored gneiss of varying texture. In the southern part of the county some hornblende schist enters into its composition. The topography is smoothest in the western part of the county and gradually becomes more rolling as the eastern part is approached.

The topography of the type as a whole is rolling, with the crests of the ridges varying from 50 to 100 feet above the stream courses. The slopes are typically long and more or less gentle. In the more rolling areas the ridges are narrower and the slopes steeper and more or less broken by heads of streams cutting back into the ridges. The surface configuration is everywhere rounded, and no level or flat areas occur. Drainage is completely established, and in the more rolling areas the run-off is rapid, resulting in erosion. Terraces are generally used to protect the land from erosion.

The Cecil sandy clay loam is the most important type found in these counties, and the greater part of the farming is done on it. It is considered a desirable soil and supports a number of well-improved farms. About 75 per cent of the type is cleared and farmed. Practically all the native forest was removed in the period of early settlement and the present forest consists of second-growth shortleaf pine, with some oaks and hickory. All the crops common to the region are produced on this type.

Cotton is the most important crop, averaging about two-fifths bale per acre, while the range in yield is from one-fourth to more than one bale per acre. Corn averages about 12 bushels per acre, but yields of 35 bushels are obtained on farms where the crop is fertilized and well cultivated. The average yield of oats is about 17 bushels per acre, the yields ranging from 10 to 35 bushels or more, depending upon the season and the care given the crop. Wheat averages about 9 bushels per acre. Cowpeas produce from one-half to 1 ton or more of hay per acre. The handling of this soil and the use of fertilizers is the same as is described under the agriculture of the counties.

The Cecil sandy clay loam is intermediate in physical qualities between the clay loam and sandy loam of the Cecil series; it is also intermediate in its agricultural value. It suffers less in dry seasons than the clay loam and less in wet seasons than the sandy loam. It is not as difficult as the clay loam to plow and cultivate, but slightly more difficult than the sandy loam.

Land of this type sells for $35 to $100 or more an acre, depending upon the location and improvements.

The greatest needs of the type are better methods of plowing and cultivation, the incorporation of organic matter, rotation of crops, and protection against erosion.

Cecil sandy clay loam, hilly phase.—The hilly phase of the Cecil sandy clay loam is separated from the typical soil on the basis of topography, the surface of areas of the phase consisting of narrow-crested ridges and slopes which are so badly broken by small streams and heads of streams that tillage is impossible.

The areas of this phase are of small extent and are confined to the northwestern part of Coweta County. They lie in the vicinity of Wahoo Creek about 1½ miles east of the Chattahoochee River. These areas are best suited for forestry or grazing.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the typical Cecil sandy clay loam taken in Fayette County:

Mechanical analyses of Cecil sandy clay loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
255804	Soil	2.7	17.8	10.7	33.4	8.2	14.3	12.9
255805	Subsoil	3.7	12.0	5.1	13.4	5.0	21.0	39.8

CECIL CLAY LOAM.

The surface soil of the Cecil clay loam consists of a brownish-red to red, friable, heavy clay loam, with an average depth of 7 inches. This rests immediately upon a heavy, stiff, brittle brick-red clay which continues to a depth of 3 feet with little or no change. When wet the subsoil is tenacious and somewhat plastic. The type is generally free from stony material except in small local spots, which are indicated on the map by stone symbols. The stones in these places consist of quartz derived from outcropping veins which cut the dominant rock formations.

The type as mapped includes areas too small to map separately, in which the soil approaches the Cecil sandy clay loam or the Davidson clay loam. In the former the variation is caused by surface layers of sand, shallow and irregularly distributed. In the latter the type is influenced by the presence of hornblende schist in the contributing rocks, which produces a darker color than typical. In a few local spots the greater part of the surface soil has been removed through erosion, leaving the heavy subsoil exposed on the surface. These areas are typical Cecil clay, but they are so small that their separation is not warranted.

The Cecil clay loam is derived chiefly through the weathering of light-colored feldspathic rock, but interlaminated with this rock are appreciable quantities of hornblende and mica schist. In a few places the underlying rocks appear to be an injection gneiss, which is composed of feldspathic and basic minerals and which is more or less common throughout the State. Where the basic rocks are present the heavy surface soil may be easily accounted for, but in other places where the soil is derived from the light-colored rocks the heavy surface material is probably the result of the removal of the sandy material through erosion. Throughout the greater part of the type the underlying rocks are obscured by a heavy covering of residual material.

This type is mapped in both Coweta and Fayette Counties in various-sized areas, but it is not as general in occurrence as the other Cecil types.

The main development of the type in Coweta County is in the central part. The largest group of areas begins at Newnan and extends northeastward to Shoal Creek, while a number of smaller areas lie between Newnan and the Campbell County line. The second important development is just east of Newnan and consists of a number of areas lying along Whiteoak Creek to the vicinity of Friendship Church. Other isolated areas are scattered through the southwestern section of the county, and there are a few in the southeastern part, in the vicinities of Senoia and Pleasant Hill Church.

In Fayette County the type is not so extensive, occurring in only a few scattered areas. The largest one is situated about 2½ miles southwest of Fayetteville, near Arnolds Grove Church. Other important areas occur in the vicinities of Shakerag and Clover, and midway between Aberdeen and Tyrone. All the areas mapped are comparatively small.

The Cecil clay loam occurs on knolls, slopes, and ridges, and has a generally rolling topography. The ridges are gently rolling to narrow crested and sharply rolling, while the slopes vary from long and gentle to steep and more or less broken. The more rolling areas are found in the southwestern part of Coweta County. Over 90 per cent of the type has a topography suitable for the use of improved implements. The topography insures good surface drainage, and in some places the run-off is too rapid. All this type is more or less protected against erosion by terracing.

About 75 per cent of this type is cleared and used for general farming. Nearly all the virgin timber has been removed, the present forest growth being made up chiefly of second-growth shortleaf pine, with some oak and hickory. The greater part of the forested area consists of the steeper slopes or somewhat eroded land. The

staple crops of the region are produced with varying degrees of success. Cotton, the most important crop, yields between two-fifths and three-fifths bale per acre. On the better farms three-fourths to 1 bale per acre is often obtained. Corn produces from 10 to 40 bushels per acre, the average yield being about 12 bushels per acre. Oats yield 12 to 35 bushels or more per acre, with an average production of about 17 bushels. Wheat averages 9 or 10 bushels per acre. The yield of cowpea hay is one-half to 1 ton or more per acre.

The Cecil clay loam supports a number of well-equipped farms, and the land generally is looked upon favorably for general farm crops, especially cotton, small grains, and forage. The heavy texture of the soil makes it necessary to use heavy implements and work stock to prepare and cultivate the land properly. It must also be worked within a narrow range of moisture conditions, as when dry it is hard to plow, and when wet it is too sticky to plow properly and a poor seed bed results. On account of the heavy surface soil, much of the precipitation runs off and crops suffer in dry seasons. The best yields are obtained in wet seasons.

The land of this type is held at prices ranging from $35 to $100 an acre, depending upon the location and improvements.

Crops on the Cecil clay loam are injured during dry seasons, although this soil is most retentive of moisture. The difficulty appears to be due to shallow plowing (about 3 inches), which does not open the soil to a sufficient depth to enable it to absorb the rainfall. Deeper plowing with subsoiling and the turning under of coarse organic matter will improve the soil in this respect. A rotation of crops that includes a legume will materially increase its productiveness.

Cecil clay loam, hilly phase.—The hilly phase of the Cecil clay loam is identical with the typical soil so far as the character of the soil material is concerned, the separation being based solely on topography. The surface of the phase is very sharply rolling to rough and broken. The areas include some narrow-crested ridges, but for the most part consist of steep slopes along the stream courses. They are too rough for successful cultivation and are mostly occupied by second-growth forest, consisting of shortleaf pine and a few oaks and hickory. This phase can best be utilized as pasture or forest lands.

The hilly phase of the Cecil clay loam covers a small total acreage. It is developed in small areas in the southwestern part of Coweta County, along Caney Creek near the Heard County line, on the east side of Mountain Creek, along Maple Branch, and south of New River near Dunbar Mountain.

DURHAM SANDY LOAM.

The surface soil of the Durham sandy loam consists of a light-gray to slightly yellowish gray, open, loose sand to slightly loamy sand, with an average depth of 7 or 8 inches. The upper subsoil begins as a pale-yellow friable loamy sand, becomes heavier with depth, and passes into a friable sandy loam. This, at an average depth of 20 inches, changes to a bright-yellow friable sandy clay, which may be somewhat brittle and compact in the lower part of the 3-foot profile. In the extreme lower part of the subsoil, at 32 to 34 inches, the material also is mottled in places with shades of yellow, gray, and orange, and occasionally with red, the mottling continuing with intensity into the compact substratum.

Some variations occur in this soil, as mapped. In places there are small areas of the Appling sandy loam into which the Durham often grades. In other places, especially around the heads of streams, the subsoil material is very light colored, being leached to a very pale yellow or cream color, and contains blotches of gray or white. Local areas also occur in low, poorly drained positions in which the soil and subsoil are a bluish gray or drab. None of these variations are of sufficient importance to warrant their separate mapping.

The Durham sandy loam is derived through the weathering of light-colored feldspathic gneiss and associated mica schist. In the areas that occur around the heads of streams or on the lower slopes of streams, where the drainage is complete, the light color of soil and subsoil is due to leaching. The land on the crests of ridges is a comparatively young soil, for there the rocks usually lie only a little below the 3-foot soil section.

This type is mapped in both Coweta and Fayette Counties, the largest development occurring in the former. The areas are generally small and irregular. The largest development in Coweta County is near Sharpsburg and in the country between the Central of Georgia Railroad along Pine Creek and the point of confluence with Whiteoak Creek. This area has an undulating surface which lies well below the surrounding soil types. In its general features it resembles the "flatwoods" areas of some parts of the Coastal Plains. The streams are only a few feet below the crests of the divides, which in themselves are nearly flat, there being no pronounced slopes toward the streams. In some places the grade from the streams to the highest points is no more perceptible than along stream terraces or first bottoms. In this area also occur small spots with bluish-colored soil and subsoil in the lower flat places and around heads of streams. Another flat area is found along Gable Branch in the extreme southeastern part of the county. Several areas are mapped in the northwestern part of the county. Just west of Pearsons Creek an elon-

gated area extends from the river southward for a distance of about 2 miles. This area is very rolling, and many outcrops of the coarse-grained granitic gneiss occur. Other areas of the type are situated at Handy and near Midway School. A small area also occurs in the north-central part of the county near the head of Little Wahoo Creek.

In Fayette County the Durham sandy loam is a much less important soil than in Coweta County. Small areas, which are scattered over the entire county, occur around the heads of the streams and along small drainage courses. Nearly all the areas occupy slopes where excessive leaching has given rise to the light color of the soil and subsoil.

While the topography ranges from very gently undulating to rolling, the surface relief is sufficient to give good drainage in all except a few local areas. The internal drainage, however, is not so thorough, and crops are damaged in wet seasons, the water being held in the soil and subsoil by the dense and compact substratum.

The Durham sandy loam is unimportant because of its small extent. In Coweta County there are some farms consisting entirely of this soil, but in Fayette County the type forms only small parts of farms. About 50 to 60 per cent of the type is cleared, the remainder being covered with second-growth shortleaf pine, with some oak and hickory. The general farm crops are produced. Cotton averages about one-fourth bale, corn about 10 bushels, oats about 12 bushels, and wheat 7 bushels per acre.

The type is the lightest upland soil in the area surveyed. Besides its use for general farming it is a good special-crop soil. Truck crops and a high-grade bright-leaf tobacco are produced with success on this type in other parts of the Piedmont region, and it is a good soil for the growing of sweet potatoes. The soil can be handled with ease and under a wide range of moisture conditions.

Land of this type in its best development sells for about $40 an acre.

APPLING SANDY LOAM.

The surface soil of the Appling sandy loam consists of a loose sand, gray to very light brownish gray in the upper part and yellowish gray in the lower part. The depth ranges from 6 to 10 inches, but averages about 8 inches. The subsoil, which in the upper part is a yellow friable loamy sand, becomes heavier with increasing depth, passing first into a friable sandy loam and, at a depth of from 15 to 24 inches, into a heavy friable sandy clay, mottled with shades of yellow, red, and gray. This material continues to 3 feet or more and usually grades into a somewhat compact and dense substratum. In places the subsoil consists of a heavy sandy clay of reddish-yellow or salmon color instead of the typical mottled color. Generally the

type is free from stony material. Small quantities of quartz fragments, coming from veins in the parent rock, occur locally.

This type is intermediate in character between the Cecil sandy loam and the Durham sandy loam and includes small areas of each which because of their small size could not be separated on a map of the scale used in the present survey. Small knolls or knobs are usually occupied by the Cecil, and the lower situations by the Durham soil, or a soil approaching the Durham in its essential characteristics.

The Appling sandy loam is derived through the weathering of granitic gneiss and associated schist. The mottled coloration in the subsoil in some situations is largely due to leaching of the material.

The Appling sandy loam has a wide distribution, but most of the areas are small. The type is mapped in both Coweta and Fayette Counties. The largest areas in the former lie in the southeastern corner, in the vicinity of Haralson, along Gray and Gable Branches. In these areas there are small spots of the Cecil sandy loam on the ridges and of the Durham sandy loam on the slopes. Another development of importance occurs in the vicinity of Sharpsburg and southwest of this place along Pine Creek. The rest of the type is scattered in various-sized areas throughout the entire county.

The Appling sandy loam in Fayette County occurs in small scattered areas. Most of these are in the southern part, in the vicinity of Longino School, Ackert, Brooks, and Lowry. Practically 90 per cent of the type in Fayette County occurs around the heads of streams.

The Appling sandy loam has a smooth or gently undulating to gently rolling topography, the relief being sufficient to insure surface drainage. In the northwestern part of Coweta County, in the vicinity of Handy, the topography in some places is strongly rolling to broken. Here the surface drainage is complete. In general the internal drainage is slow, and the soil fills with water, often injuring the crops. The compact substratum is the main cause of this condition.

The type is of relatively little importance, on account of its small extent. In only a few places in Coweta County are the areas large enough to comprise several farms. About 60 per cent of the type is cleared, the rest being covered with second-growth shortleaf pine, with some oak and hickory. The general farm crops are grown. Cotton averages about one-fourth bale per acre, and occasionally three-fourths bale per acre is obtained. The average corn yield is 10 bushels per acre, and wheat and oats return 7 and 12 bushels per acre, respectively. The lowest yields are obtained on the small areas around the heads of streams and on those lying on the lower slopes along the steams.

Land of this type sells for $35 to $40 an acre, depending upon the location and improvements.

DAVIDSON CLAY LOAM.

In the typical development of the Davidson clay loam the surface soil consists of about 7 inches of a dark-red or maroon-red friable heavy clay loam. The subsoil is a heavy, smooth, compact, deep-red to maroon-red clay, which extends to a depth of 3 feet or more. The subsoil is very sticky and plastic when wet. Included with the type are small areas of a darker variation in which the surface soil is a rather mellow, friable, heavy loam to clay loam of a very dark brownish red or chocolate color. This material may extend to 12 or 14 inches, where it gradually becomes heavier, passing into a friable, mellow silty clay loam to silty clay of a very dark red color. At about 18 inches this changes to the typical heavy clay, although in some places it may extend without change throughout the soil profile. In some few spots the type consists of a dark chocolate colored mellow clay loam to a depth of 24 or 30 inches with practically no change, such areas being called "dead land" or "push land." There are also small spots in which the heavy clay of the subsoil lies within 2 or 3 inches of the surface. These areas are properly Davidson clay and are included only on account of their small extent. Such areas occupy knolls and slopes where erosion has been active. Spots also exist in which a thin surface layer of fine sand occurs, but the presence of this layer is not typical.

The type, as mapped in the present survey, contains a large amount of stony material. Areas in which this condition is pronounced are indicated on the map by stone symbols. The fragmental rock consists of large bowlders of hard trap rocks, chiefly diabase, or of small angular fragments of hornblende schist.

The Davidson clay loam is a residual soil derived through the weathering of dark-colored basic rocks. In some places it is derived exclusively from hornblende schist, in other places from diabase or diorite, and in still others from both these classes of rocks, which occur in close association.

The type is not extensive, although it is developed in areas of considerable size in both Coweta and Fayette Counties.

In Coweta County the type forms a narrow, ribbonlike belt with several enlargements extending in an almost continuous straight line from about 3 miles east of Newnan south to the Meriwether County line. This area follows a dike of very hard, dense, and dark-colored diabase or diorite, and the entire area is very stony. Where the belt widens the areas are not so stony; some are stone-free and may be derived from hornblende schist which is associated with the trap

rocks in these places. Besides this belt there are a number of scattered areas in the southwestern part of the county. These are derived from hornblende schist. A number of areas also lie in the north-central part of the county, chiefly in the vicinity of Madras and McCollum.

In Fayette County the largest development of the Davidson clay loam is in the southern part, beginning along the Flint River at Hills Bridge and extending southwestward in a strip of irregular width to Whitewater Creek. This area covers about 4½ square miles. At Woolsey there are two other areas with a combined area of a little more than 1 square mile. Small areas also occur in the northwestern section of the county, near Clover, Line Creek Church, and Flat Creek Church, and several miles west of this church. Between Harp and Crossroads School there are several important areas. Most of the type in this county is derived from hornblende schist, with some associated diorite. Small fragments of the schist are commonly found over the surface of the type.

The Davidson clay loam has a rolling topography. The surface features consist of broad rolling ridges with some rather steep slopes. As a rule these ridges stand out rather prominently from the surrounding country. This is especially true of those in the southern part of Fayette County. The relief everywhere promotes good drainage.

This soil is among the strongest upland soils of the survey, and its productiveness is generally recognized. From 80 to 85 per cent of it is cleared and used for farming. The uncleared areas comprise some of the steeper slopes and the more stony areas in Coweta County. The native vegetation consisted of a hardwood growth of oaks and hickory with some pine, but this forest has been removed almost entirely, the present forest consisting of second-growth shortleaf pine with a few scattered oaks and hickory. All the common crops of the region are produced successfully on this type. Cotton, the chief crop, averages fully one-half bale per acre, and yields of 1 bale per acre are common. Corn gives an average yield of 14 to 16 bushels per acre, although 40 or more bushels are obtained on well-prepared land in favorable seasons. The oat crop averages from 15 to 20 bushels, and wheat about 12 bushels per acre. Cowpeas produce an average of 1 ton of hay per acre.

Land of this type ranges in price from $40 to $100 an acre, depending upon the location and improvements.

The Davidson clay loam is a heavy type of soil and must be handled within a narrow range of moisture conditions. When it is plowed too wet serious injury results. The land should also be terraced to prevent erosion. The type is a strong soil, especially

for general farm crops, small grains, grasses, and the legumes, including alfalfa. It is also a good soil for the production of peaches.

LOUISA SANDY CLAY LOAM.

The surface soil of the Louisa sandy clay loam, in the undisturbed state, consists of about 3 inches of a grayish-brown to brown friable loamy sand to light sandy loam, underlain by a brownish-red friable clay loam which extends to an average depth of 7 or 8 inches. When the soil is plowed and the two layers of the surface are mixed there results a friable sandy clay loam of a light brownish red color. On the surface and through the soil section there is a large quantity of mica scales. The subsoil is a somewhat brittle red clay, containing an abundance of mica which gives it a characteristic slick or greasy feel. Owing to the high mica content the subsoil in places is quite friable. Throughout the typical areas there are scattered small spots of sandy loam and clay loam, resulting from the uneven distribution of the sandy veneer. In places fragments of the underlying rock formation are scattered over the surface or embedded in the soil and subsoil. The weathered or partly decomposed underlying rock is commonly found within the 3-foot soil section. The Louisa sandy clay loam is derived through the weathering of highly micaceous schist and gneiss.

This type is rather small in extent. Its principal development in Coweta County comprises a number of areas in the southern part, beginning about a mile east of Moreland along Little Whiteoak Creek and extending southward to within a short distance of the Meriwether County line. This soil is typically developed throughout this entire region. Outlying areas lie east and west of the main belt of the type. Small areas are situated along Yellowjacket Creek and New River. On the east it is developed in the vicinity of Elders Mill. Two areas occur on Alexander Creek in the northern part of the county.

The surface features of the type consist of undulating divides and long gentle or short rounded slopes, resulting in a gently rolling to rolling topography. The drainage is good.

The greater part of the Louisa sandy clay loam is cleared and farmed. The rest is in forest consisting of second-growth shortleaf pine. The type supports a number of well-established farms, on which the common crops of the region are grown as successfully as on the Cecil sandy clay loam.

Land of the Louisa sandy clay loam sells for $40 to $75 an acre, depending upon the location and improvements.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Louisa sandy clay loam, taken in Coweta County:

Mechanical analyses of Louisa sandy clay loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
255704	Soil	10.5	23.2	10.1	26.7	4.5	11.8	13.3
255705	Subsoil	6.6	17.3	6.3	15.9	3.5	13.3	37.1

IREDELL FINE SANDY LOAM.

The sandy soil of the Iredell fine sandy loam is a friable, mellow, dark-gray to grayish-brown fine sandy loam in the upper part and a somewhat yellowish fine sandy loam in the lower part. The average depth of the soil is about 8 inches. The subsoil in the upper part is a heavy sandy clay of yellowish color, splotched with some brownish-red iron stains. This continues to an average depth of 10 to 15 inches, where it gives way to a very heavy, plastic, sticky, waxy clay having a yellowish-brown color with a greenish or olive tint. This coloration is due to a minute mottling of shades of yellow, brown, gray, and green. Small brown to dark-brown iron concretions occur on the surface and in lesser quantities in the soil mass. Small fragments of the underlying rock may also occur on the surface.

The Iredell fine sandy loam is an upland type derived from dark-colored basic rocks, chiefly hornblende schist. The subsoil normally passes into the weathered rock within the 3-foot section.

This type has a very small extent. It is developed only in Coweta County. The largest area, consisting of about 25 acres, is mapped in the southeastern part of the county, about 1 mile west of Haralson. Areas containing 5 to 8 acres each lie in the northwestern section of the county near Happy Valley School, Bethel Church, and about 1 mile northwest of Sewells Mill.

The type has an undulating topography, with sufficient relief to promote good drainage. The heavy impervious subsoil interferes with the movement of moisture, and the subdrainage is not well developed.

Most of the type is cleared and is used for the production of the general farm crops or as pasture. Cotton yields about one-half bale, corn 12 to 14 bushels, and oats 15 bushels per acre. The best yields are obtained in seasons of moderate rainfall.

WICKHAM FINE SANDY LOAM.

The surface soil of the Wickham fine sandy loam is a brown to reddish-brown, heavy fine sandy loam of a mellow and friable structure, with an average depth of 8 inches. The subsoil is a heavy, fri-

able, brownish-red to red fine sandy clay to a depth of 3 feet, or it may consist of an upper layer of this character, 4 to 20 inches thick, passing into a heavy, light-red silty clay to silty clay loam. In places stratified material, consisting of layers of various textures and colors, make up the main part of the subsoil. Small areas having a sandy clay loam or fine sand surface soil have been mapped with this type. Areas containing small rounded gravel occur in a few places.

The Wickham fine sandy loam is an old alluvial soil developed on terraces standing well above high water. The material has come from crystalline rocks. This type is not extensively developed, occurring only in small areas along the rivers which touch the counties. In Coweta County the largest area, consisting of about 200 acres, lies on the Chattahoochee River in the northwestern part. Other areas ranging in size from 10 to 65 acres occur at intervals along this river. In Fayette County four areas ranging in size from 20 to 50 acres are mapped along the Flint River. The areas have a smooth even surface with sufficient relief to afford good drainage.

Although of small extent, the type is considered very desirable, and all of it is cleared and in cultivation. The common crops of the region are produced with success. The average yield of cotton is between one-half and three-fourths bale per acre, and yields under favorable conditions reach 1 bale per acre. Corn and oats average about 20 bushels per acre.

Land of this type sells with the first-bottom or Congaree types for $50 to $75 an acre.

CONGAREE FINE SANDY LOAM.

The surface soil of the Congaree fine sandy loam is a mellow, friable to loose, loamy fine sand to light fine sandy loam of light-brown to grayish color. The average depth of the soil is about 8 inches. The subsoil is variable, but for the most part consists of a brown to brownish-red, friable, heavy fine sandy loam to fine sandy clay, which extends to depths well below the 3-foot limit of the soil profile. It is not unusual to find a brownish-red, friable silty clay in the lower section of the subsoil. Very often the subsoil consists of strata of materials of various colors and textures. At some points along the immediate banks of the river there are narrow strips, possibly 100 feet in width, which consist of light-brown to pale-yellow fine sand to a depth of 3 feet or more. These areas comprise small natural levees which have been built up by the river. Other variations, including spots of sandy loam and clay loam, are encountered, but these are too small to be mapped separately.

This type of soil is composed of material gathered from the region of crystalline rocks and deposited during times of overflow by the

waters of the Chattahoochee River. The areas are in the first bottom, are subject to overflow, and the materials may be added to or changed during each succeeding flood.

The Congaree fine sandy loam has a small extent and is found only in Coweta County. It is developed as a narrow strip, from 300 to 1,000 feet wide, almost continuously along the entire course of the Chattahoochee River. The surface is smooth and level to flat and the drainage is fair during normal stages of the river.

Practically all the type is cleared and used almost entirely for the production of corn, which averages about 20 bushels per acre, although the range in yield is quite wide. On the deep sandy areas the yield is very low, but where there is a heavy subsoil within 12 to 18 inches of the surface, it may reach 40 bushels per acre. Sorghum and cowpeas produce a large quantity of forage. Watermelons would do well on this soil, especially on the better drained areas.

CONGAREE SILTY CLAY LOAM.

The surface soil of the Congaree silty clay loam consists of a friable, smooth, reddish-brown silty clay loam, with an average depth of 7 to 8 inches. The subsoil under typical conditions is not very different from the surface, consisting of a heavy, friable, somewhat mellow silty clay loam to silty clay of a brownish-red to light-brown color. Mottlings of various colors, chiefly gray and yellow, are common in the lower part of the subsoil.

Included with this type are small spots in which the surface material varies from fine sand to fine sandy loam. These sandy patches are local in nature and are the result of recent inundations. Also the subsoil in many places consists of strata of material differing in texture and color, while in other places sands may comprise the entire lower part of the subsoil. Areas of Meadow (Congaree material) are included with this type where they were too small to map separately.

The Congaree silty clay loam is a first-bottom type, the material, coming originally from soils derived from crystalline rocks, having been transported and deposited by the streams along which it occurs.

This type is mapped on a number of the streams in both Coweta and Fayette Counties. Several important areas are situated on the Chattahoochee River in the northwestern part of Coweta County. The largest development is found along Line Creek in the eastern part of the county. It is also developed in a broad strip in the bottoms of Whiteoak and Mountain Creeks. The chief area in Fayette County forms the broad flood plains of Flint River, and smaller areas lie along a few of the other streams of the county.

The Congaree silty clay loam has a low, flat topography with practically no interruptions except a few sloughs. The areas are subject

to overflow, many of them being flooded by a 5-foot rise in the streams, and frequently the entire area of the type may be covered with water.

This soil is among the strongest and most fertile of the soils of the area for corn and forage crops, but owing to the danger of overflow, which may cause a complete loss of the crops, very little of the type is under cultivation. The native forest consists of a heavy mixed growth, comprising chiefly sycamore, ash, water oak, hickory, shortleaf pine, black gum, sweet gum, ash, hackberry, tulip poplar, white oak, red oak, elm, willow, and a number of other species. Some cleared areas are used for pasture, the common grasses of the region affording excellent pasturage and good yields of wild hay. Corn, the leading cultivated crop, yields from 20 to 40 bushels per acre. The ordinary yield of oats is 20 or 25 bushels per acre, but only a small acreage of this crop is grown. Cowpea hay yields 1 ton or more per acre. No fertilizers are used on this type, enrichment of the soil by overflow being depended upon to maintain productiveness.

This type is generally sold with the adjoining uplands.

The successful drainage of the type would open for safe cultivation about 16 square miles of productive lands.

MEADOW (CONGAREE MATERIAL).

Meadow (Congaree material) comprises areas of bottom lands in which the soil material is so mixed and irregular in occurrence that no type designation can be given. In its greatest development it consists of strata of sand, fine sand, loamy sand, sandy loam, and silty clay loam of various colors which may occur at any depth and in irregular arrangement. These strata also vary from a fraction of an inch to a foot or two in thickness. Areas of sand, "sand flats," are typical in the areas of Meadow. The material is light colored, has been deposited more or less recently by flood waters, and forms the poorest land in the Meadow type.

Meadow is alluvial in origin, and its lack of uniformity is due to the deposition of different grades of material during different floods. It is mapped along practically every stream in the area and occupies low first bottoms that are subject to overflow after practically every heavy rain.

About 40 per cent of the type is cleared and used for the production of corn and forage crops or for pasture. The uncleared areas are forested with about the same species as the Congaree silty clay loam, but the growth is not as thick and does not attain the height found on the latter type. Willow and alder are common on the more sandy areas.

The yields of corn are quite variable, ranging from 15 to 30 bushels per acre, the higher yields being obtained on those areas

which contain the higher percentages of silt and clay. No fertilizers are used on this type. The Meadow affords excellent summer pasturage for cattle, and in places the wild grasses are cut for hay.

The price of land under this classification varies with that of the adjoining uplands.

SUMMARY.

Coweta and Fayette Counties are situated in the western part of Georgia, the northern boundary being about 25 miles south of Atlanta. The area comprises 643 square miles, or 411,520 acres.

The counties lie within the Piedmont region. The topography in the main is rolling, with some small areas of sharply rolling to hilly country, but becomes more broken as the rivers on the western and eastern borders are approached.

The drainage, which is complete and reaches all parts of the area, is carried by the Chattahoochee and Flint River systems. The Atlanta & West Point Railroad practically follows the divide between these rivers.

Coweta County was formed in 1826. It had a population of 29,047 in 1920, 75.8 per cent of which is classed as rural. Newnan is the most important town in the two counties. Grantville and Senoia are other towns of importance.

Fayette County was formed in 1821. In 1920 it had a population of 11,396, all of which is classed as rural.

Adequate railroad facilities are afforded by the Atlanta & West Point, two branches of the Central of Georgia, the Atlanta, Birmingham & Atlantic, and Southern Railroads.

The public-road system and telephone and rural mail service extend to all parts of the area.

The climate of the area is characterized by long hot summers, short open winters, and ample rainfall, well distributed throughout the growing season. The length of the average growing season is about 225 days.

The agriculture of Coweta and Fayette Counties is centered about cotton production. In Coweta County in 1919 there were 30,525 bales produced on 67,829 acres, or an average of 0.45 bale per acre. In Fayette County in the same year 16,207 bales were obtained on 33,587 acres, or an average of 0.48 bale per acre. A part of the cotton produced in Coweta County is utilized by local mills.

The corn crop is second in importance to cotton, but is insufficient to supply the local demands. It is produced on 28 and 29 per cent of the improved farm land in Coweta and Fayette Counties, respectively. The average yield in 1919 was 14.2 bushels in Coweta County and 14 bushels in Fayette County.

Cowpeas are grown for forage, seed, and soil improvement.

Small grains, such as oats, wheat, and rye, are grown on less than 3 per cent of the improved farm land.

The production of beef and pork products is not sufficient to supply local needs. Increased interest is being manifested in live-stock industries.

The work stock consists principally of mules. Light implements are commonly used, but improved farm implements are gradually coming into use.

Great dependence is placed upon commercial fertilizers in the production of the cotton crop and to a small extent in growing corn. The expenditure for fertilizers in 1919 in Coweta County was $196,008, and in Fayette County, $280,104. The average application consists of 250 pounds per acre of a 9–3–3 or 10–2–2 mixture.

No definite crop rotations are practiced.

In 1919, 82 per cent of the farms in Coweta County and 77.7 per cent of the farms in Fayette County were operated by tenants.

The soils of the two counties are classified under 8 series, represented by 11 types and 3 phases, and Meadow.

The upland types are derived through the weathering of the crystalline rocks which underlie the region. Light-colored feldspathic rocks comprise the principal group of rocks. Dark-colored basic rocks represent a second important group, and a small area of mica schist and mica gneiss is a third group which influences the soils.

The alluvial soils are divided into first-bottom and second-bottom types. The material was originally derived from crystalline rocks, but has been assorted and modified by the agency of running water.

The Cecil sandy loam is well developed in both Coweta and Fayette Counties. It forms a part of the area known as the "gray lands." It is well suited to general farm and special crops.

The Cecil sandy clay loam is the most extensive type mapped in this area. It is a good general farming soil and forms the basis for an important agriculture.

The Cecil clay loam is a well-developed type in this area. It forms a part of the "red lands" and is well suited to general farming.

The Durham sandy loam is typically developed in the area. It forms the lightest upland soil suitable for general farming. It can be used to good advantage for special crops, such as tobacco, and for sweet potatoes and other truck crops.

The Appling sandy loam is mapped in all parts of the survey. It is a light soil, adapted to both general farm and special crops. The yields are slightly lower than on the Cecil sandy loam.

The Louisa sandy clay loam is of small extent. It is found only in Coweta County.

The Davidson clay loam is a strong productive soil, especially valuable in the production of small grains and forage crops. The type is developed in typical areas in both Coweta and Fayette Counties.

The Iredell fine sandy loam is mapped only in small areas in Coweta County.

The Wickham fine sandy loam is a second-bottom alluvial soil well suited to general farming.

The Congaree fine sandy loam is a first-bottom alluvial type occurring along the Flint and Chattahoochee Rivers. It is subject to overflow. It is a strong soil for corn and forage crops.

The Congaree silty clay loam is one of the most fertile soils of the area, but is subject to overflow. Corn and forage crops produce excellent yields where not damaged by floods.

Meadow (Congaree material) represents first-bottom alluvial lands so mixed in character of material that no single type designation could be assigned to it.

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CURTIS F. MARBUT, IN CHARGE SOIL SURVEY

SOIL MAP
GEORGIA
COWETA AND FAYETTE COUNTIES SHEET

GEORGIA STATE COLLEGE OF AGRICULTURE
ANDREW M. SOULE, PRESIDENT
DAVID D. LONG, IN CHARGE SOIL SURVEY

LEGEND

Symbol	Soil
Al	Appling sandy loam
Cl	Cecil sandy loam
Cl	Cecil sandy loam, Hilly phase
Cs	Cecil sandy clay loam
Cs	Cecil sandy clay loam, Hilly phase
Cc	Cecil clay loam
Cc	Cecil clay loam, Hilly phase
Cf	Congaree fine sandy loam
Ca	Congaree silty clay loam
Dc	Davidson clay loam
Ds	Durham sandy loam
Is	Iredell fine sandy loam
Ls	Louisa sandy clay loam
W	Wickham fine sandy loam
M	Meadow (Congaree material)

CONVENTIONAL SIGNS

W. Edward Hearn, Inspector Southern Division.
Soils surveyed by David D. Long, of the Georgia State College of Agriculture, in charge, and A. L. Patrick, A. M. O'Neal, Jr. and F. H. Stevens of the U. S. Department of Agriculture.

1 ½ 0 1 2 3 4 Miles
Scale 1 inch = 1 mile

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Field Operations
Bureau of Soils
1919